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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/544,109

08/02/2005

Hirokatsu Miyata

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EXAMINER

DESAI, ANISH P

ART UNIT

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1771

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/544,109	Applicant(s) MIYATA ET AL.	
	Examiner Anish Desai	Art Unit 1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/09/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 6-13 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/02/05&06/22/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I claims 1-5, 14, and 15 in the reply filed on 07/09/07 is acknowledged. The traversal is on the ground(s) that the restriction is not warranted because the inventions of both groups are directed to the same inventive concept. This is not found persuasive because as set forth in 06/07/07 Office Action, under the PCT Rule 13.1, the inventions listed as Groups I-II do not relate to a single general inventive concept because under PCT Rule 13.2 they lack the same or corresponding special technical feature for the reasons set forth in the aforementioned Office Action.

The Group II claims 6-13 and 16 may be rejoined with Group I claims 1-5, 14, and 15 upon an indication of allowable subject matter.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-5 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 5, and 15 recites "inorganic material". It is noted that the only inorganic material disclosed in the specification is silica. Thus, the aforementioned limitation of inorganic

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material in the claims 1,5, and 15 is open ended whereas the support for said limitation in the specification is finite. The predictability of effect of all inorganic materials in the described invention is not established and would require undue experimentation to determine the suitability of all inorganic materials. Since claims 2-4 depend from the rejected claim 1, these claims are rejected as well.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 5 recite “a local periodic structure in an optional section”, it is unclear as to what is meant by “optional section”. If a section is optional, then modification of it does not further limit the claim since in effect it isn’t present.

Claims 2-4 recite “two or more kinds of surfactants”, it is not clear as to what the scope of “more kinds of surfactants” encompasses, an infinite variety? Also, phrases such as “kinds” are vague and ambiguous because it is not clear as to what is meant by “more kinds” of surfactants.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5, and 15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over article by Besson et al., *A New 3D Organization of Mesopores in Oriented CTAB Silica Films*, J. Phys. Chem. B 2000, 104, pp. 12095-12097.

Besson discloses highly organized and textured cetyltriethylammonium bromide (CTAB) surfactant (amphiphilic molecular assemblies) templated silica films that have a 3D- hexagonal packing of spherical micelles (separated by polymeric silica walls (inorganic material) (abstract). The spherical micelles are formed of surfactant (amphiphilic molecular assemblies) (see page 12095), and the pores (holes) of the mesoporous silica films of Besson are periodically arranged (regularly arranged) and have 3D pore network (see page 12095). The films are synthesized by depositing the film forming solution by spin coating on glass plates (substrate) (see page 12095). The films of Besson are CTAB templated silica films with a 3D hexagonal symmetry (see page 12097). Based on the aforementioned disclosure of Besson, the structure of the film of Besson and that of Applicant is identical.

Regarding claims 1, 5, and 15, Besson discloses what has been set forth above except for the local periodic structure in an optional section in parallel with the substrate of the film has a 6-fold axis perpendicular to a film plane and symmetric reflective surfaces of the structure

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including the 6-fold axis are facing in the same direction across the entire film, and the arrangement of the amphiphilic molecular assemblies has a 6-fold axis. It is noted that the features are only claimed in a “optional section”. Optional means the section is not required and therefore are not positively recited in the claim. Thus, the above structure of Besson accounts for the claimed features of the invention. Alternatively, however, it is reasonable to presume that these features would necessarily present in the mesoporous silica film of Besson. It is noted that the aforementioned features of the claimed invention are determined using X-ray diffraction analysis once the film structure is formed (see 0045 of US Patent Application Publication 2006/0204758A1 of the presently claimed invention). As shown above in this Office Action, the structure of the film of the presently claimed invention and that of Besson are same.

Additionally, it is noted that the film of Applicant and that of Besson are generally formed using same method. For Example, Applicant has stated “The mesostructured silica film can be formed by retaining the substrate in an aqueous solution containing a surfactant which is an amphiphilic molecule, silicon alkoxide which is a silica source, and an acid serving as a hydrolysis catalyst. On the substrate, surfactant micelles which are amphiphilic molecular assemblies and an alkoxide precursor which is produced through hydrolysis and is a silica precursor form a mesostructured silica film regularly arranged through self-assembly.” (0039 of Patent Application Publication US 2006/0204758A1 of the presently claimed invention). The process of forming the films of Besson’s invention is described on page 12095 and it is similar to that of Applicant’s process. Thus, it is the Examiner’s position that the aforementioned features of the local periodic structure in an optional section in parallel with the substrate of the film has a 6-fold axis perpendicular to a film plane and symmetric reflective surfaces of the structure

including the 6-fold axis are facing in the same direction across the entire film, and the arrangement of the amphiphilic molecular assemblies has a 6-fold axis would have been present in the Besson's invention. The burden is upon Applicant to prove it otherwise (see *In re Fitzgerald*, 205 USPQ 594). In addition, the presently claimed features would obviously have been present once the film of Besson is provided (see *In re Best*, 195 USPQ at 433, footnote 4 CCPA 1977).

5. Claims 2-4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besson et al. *A New 3D Organization of Mesopores in Oriented CTAB Silica Films*, J. Phys. Chem. B 2000, 104, pp. 12095-12097 as applied to claim 1 above, and further in view of Liu et al. (US 2002/0034626A1).

Regarding the preamble of "X-ray optical device" of claim 14, this claim does not set forth any structure associated with the X-ray optical device, except reciting "X-ray optical device" in the preamble, thus it is the Examiner's position that the film of Besson as applied to claim 1 is functionally capable of being used with a X-ray optical device.

Besson is silent with respect to teaching amphiphilic molecular assemblies comprising surfactant micelles containing two or more kinds of surfactants different in structure respectively, wherein each surfactant has identical hydrophobic portions but hydrophilic polyethylene oxide portions are different in molecular chain length. However, Liu discloses a mesoporous silica film having a low dielectric constant and a wafer coated with such a mesoporous silica film (abstract). The invention of Liu has utility in the fields of semiconductor devices, low dielectric constant coatings on fibers and other structures, and in catalytic supports (0008). The primary reference of Besson's invention is noted to be useful in the fields of

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catalysis, filtration etc. (page 12095 of Besson). Further paragraphs 0055-0056 of Liu disclose various nonionic surfactants that are used in the formation of the mesoporous film of Liu's invention. These surfactants of Liu contain polyethylene oxide and can be used in combinations (0056). Additionally, Liu discloses mixture of surfactants such as C12EO10 and C12EO4 (0040,0056), which are different in structure with identical hydrophobic portions and different chain lengths of polyethylene oxide. The films of Liu have thickness uniformity, minimum surface texture, and mechanical integrity (0022). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use two or more kinds of surfactants different in structure having identical hydrophobic portions and hydrophilic polyethylene oxide portions different in molecular chain length, motivated by the desire to form a film having thickness uniformity and mechanical integrity.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Desai whose telephone number is 571-272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./
APD

/Terrel Morris/
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Group Art Unit 1771